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CHRISTIE, PARKER & HALE, LLP
PO BOX 7068
PASADENA, CA 91109-7068

EXAMINER	
BROWN JR, NATHAN H	
ART UNIT	**PAPER NUMBER**
2121	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/524,606	LI, JINYAN	
	Examiner	Art Unit	
	Nathan H. Brown, Jr.	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *(3)* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 June 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-46 and 57-67* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-46 and 57-67* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 2/14/05
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

AC 9/2/07

Examiner's Detailed Office Action

1. This Office Action is responsive to the communication for application 10/524,606, filed June 11, 2007.

2. Claims 1-46 and 57-67 are pending. Claims 1, 2, 11, 12, 34, 36, 38-42, 45, 57, 58, 67, are currently amended. Claims 47-56 and 68-75 are cancelled. Claims 3-10, 13-33, 35, 43, 44, 46, 59, and 61-66 are previously presented.

3. After the previous office action, claims 30-49 stood rejected.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 1-10 and 21-46 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter: mathematical abstraction, algorithm, and/or software per se.

Amended independent claim 1 recites a "method of classifying an object into one of a number n of classes wherein n is 2 or more, wherein information concerning said object is provided in a plurality of test data T" where the final result is "deducing which of said n classes the object is categorized in, by selecting the highest of said n scores". Claims 2-10 and 21-46 provide the mathematical or algorithmic or software procedural details of claim 1. Claims 21-46 also provide further description of the data. Amended independent claim 1 is considered to recite a process that includes the §101 judicial exceptions of mathematical abstraction, algorithm, and/or software per se, as claim 1 recites no physical transformation, computer hardware, data structure, or storage medium. Now, while "classifying an object into one of a number n of classes" maybe considered to be concrete and useful, its tangibility is questionable, in that, the tangible requirement requires that the claim must recite more than a §101 judicial exception, and in that process set forth a practical application of that §101 judicial exception to produce a real-world result.

Claims 21-46 recite a range of types of data to be classified and an instance to classification classes. However, what is nowhere disclosed is what the claimed classification results in, in the real world, for the problem domains of the cited data. For example, classifying gene expression data acquired from a micro-array (claims 34 and 35) has no substantial and specific result, in isolation or without consequence in some diagnostic or therapeutic framework. Neither does classifying a cell type as cancerous or non-cancerous (claims 36 and 37) because cancerous or non-cancerous are mathematical abstractions (i.e., class vectors) derived from data modeling or other means. The Examiner considers "classifying an object into one of a number n of classes"

clearly abstract (even if the classes are named for real world entities) in comparison to results like the final share price momentarily fixed for recording and reporting, of *State Street*, or the measurement of blood sugar level for diagnostic purposes. Thus, claims 1 recites no more than a §101 judicial exception of mathematical abstraction, algorithm, and/or software per se and is thus considered to be non-statutory under 35 U.S.C. 101. Since claims 2-10 and 21-46 depend from claim 1 without curing the deficiency of claim 1, claims 1-10 and 21-46 are considered to be non-statutory under 35 U.S.C. 101.

6. Claims 11-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter: mathematical abstraction, algorithm, and/or software per se. Amended independent claim11 recites a "method of classifying an object into a first class or a second class, wherein information concerning said object is provided in a plurality of test data T" where the final result is where the final result is "deducing whether the object is categorized in the first class of data or in the second class by selecting the highest of said first score and second score". Claim 11 is considered to be non-statutory under 35 U.S.C. 101 in the same way as is claim 1. Claims 12-20 provide only the mathematical and algorithmic limitations of claim 11. Since claims 12-20 depend from claim 11 without curing the deficiency of claim 11, claims 11-20 are considered to be non-statutory under 35 U.S.C. 101.

7. Claims 57-66 are rejected under 35 U.S.C. 101 because the claimed invention is abstract, lacks utility, and violates the doctrine of preemption. Amended independent claim 57 recites a "system for classifying an object into a first class or a second class, wherein information

concerning said object is provided in a plurality of test data T" where the final result is to "deduce whether the object is categorized in the first class or in the second class by selecting the higher of the first score and the second score". Claim 57 is considered to lack utility because it is abstract in the same way as is claim 1. Further, classifying an object into a first and second class by deducing "whether the object is categorized in the first class or in the second class by selecting the higher of the first score and the second score" is well known to practitioners of ordinary skill in the arts of pattern recognition, and the data claimed as a limitation to claim 57: "gene expression data, patient medical records, financial transactions, census data, characteristics of an article of manufacture, characteristics of a foodstuff, characteristics of a raw material, meteorological data, environmental data, and characteristics of a population of organisms", is considered to preempt the use of the classification approach in every conceivable area where pattern recognition can be applied. Claim 57 is considered, therefore, to be non-statutory under 35 U.S.C. 101. Claims 58-66 provide the mathematical and algorithmic limitations of claim 57. Since claims 58-66 depend from claim 57 without curing the deficiency of claim 57, claims 57-66 are considered to be non-statutory under 35 U.S.C. 101.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 11, and 67 are rejected under 35 U.S.C. 102(b) as being anticipated by *Wang et al.*, (*Wang*) "Monitoring gene expression profile changes in ovarian carcinomas using cDNA microarray", 1999.

Regarding claims 1 and 11 (where n = 2). (Currently Amended) *Wang* teaches a method of classifying an object into one of a number n of classes wherein n is 2 or more (*see* p. 104, §3.2, col. 2, "...two criteria were used to classify candidate cDNAs as differentially expressed between normal and neoplastic ovary", *Examiner inteprets "normal and neoplastic ovary" as a number n of classes wherein n is 2 or more.*), wherein information concerning said object is provided in a plurality of test data T (*see* p. 103, §3.1, *Examiner interprets the cDNA libraries to comprise a plurality of test data T.*), the method comprising the steps of:

extracting a plurality of emerging patterns from a training data set D that has at least one instance of each of said n classes of data corresponding to said n classes (*see* p. 104, §3.2, col. 1, "To investigate and monitor the gene expression profile changes in ovarian cancers, replicates of the fabricated cDNA arrays were hybridized independently with cDNA probes that were generated from seven different ovarian tumor specimens, including two papillary serous ovarian tumors, two endometroid ovarian cancers, one poorly differentiated ovarian tumor, one mucinous and one clear cell ovarian tumor.", *Examiner interprets the "seven different ovarian tumor specimens" to comprises training data set D that has at least one instance of each of said n classes of data corresponding to said*

n classes.), wherein each of said emerging patterns comprises a plurality of conjunctive conditions (*see* p. 104, §3.2, col. 2, *Examiner interprets the "cDNA clones exhibited a 3-fold or greater change in expression level in more than one ovarian tumor probe, and the signal intensity exceeded the background" [emphasis added] to be conjunctive conditions.*), each condition having a variable and a constraint (*see* above, *Examiner interprets "expression level" to be a variable and "3-fold or greater change" to be a constraint.*), and wherein a plurality of occurrences satisfy said conditions for an ith one of said n classes of data (*see* p. 104, Fig. 1(B), *Examiner interprets the "value of Cy3 and Cy5 hybridization signals from each clone" to be a plurality of occurrences that satisfy said conditions for an ith one of said n classes of data.*), but no occurrence satisfies said conditions for a remainder of said n classes of data (*see* above, *Examiner interprets the fact that none of the values on the control group (see Fig. 1(A)) satisfy the conjunctive conditions to mean that no occurrence satisfies said conditions for a remainder of said n classes of data.*);

creating n lists (*see* p. 104, col. 2, "After analyzing ...", Examiner interprets n = 2 and the first list to be the "295 cDNAs" exhibiting "greater than 3-fold overexpression in tumor probe relative to normal probe" and the second list to be the "431 cDNAs" exhibiting "greater than 3-fold overexpression in normal probe relative to tumor probe".), wherein:

an ith list of said n lists contains a frequency of occurrence, $f_i(m)$, of each emerging pattern $EP_i(m)$ from said plurality of emerging patterns that has a non-zero occurrence in an ith class of data (see above, *Examiner interprets* $f_1(1) = 295$ *and* $f_2(2) = 431$.);

using a fixed number, k, of emerging patterns, wherein k is substantially less than a total

number of emerging patterns in the plurality of emerging patterns, calculating n scores (see p. 103, §3.1, col. 1, Examiner interprets the "selected ESTs and clones from several ovarian cDNA libraries", making up the microarray, to contain the emerging patterns (i.e., genes). Examiner interprets k to be the 96 "randomly picked cDNA clones" which is much less than the 5766 members of the microarray.); wherein:

an ith score corresponding to an ith class of said n scores is derived from the frequencies of k emerging patterns in said ith list that also occur in said test data (*see* p. 104, Figs. 1(A) and 1(B) and p. 104, Examiner interprets each scatter gram to comprise an ith score of said n scores derived from the frequencies of k emerging patterns in said ith list that also occur in said test data.); and

deducing which of said n classes the object is categorized in, by selecting the highest of said n scores (*see* p. 104, Figs. 1(A) and 1(B) and p. 104, col. 1, "Hybridization results of the microarray with Cy3-labeled cDNA probe from normal ovary and Cy5-labeled cDNA probe from ovarian tumor demonstrate that, on average, approx. 30% of the cDNAs exhibit more than a 2-fold expression level change and about 9% of the cDNAs had a difference in expression of greater than 3-fold. Scatter plots with tumor probes revealed a very wide distribution pattern (Fig. 1B).").

Regarding claim 67. (Original) *Wang et al.* teach a method of determining whether a sample cell is cancerous (*see* p. 104, §3.2, col. 2, "...two criteria were used to classify candidate cDNAs as differentially expressed between normal and neoplastic ovary. The cDNA clones exhibited a 3-fold or greater change in expression level in more

than one ovarian tumor probe, and the signal intensity exceeded the background.", *Examiner interprets "neoplastic" to be an adjective, meaning of or pertaining to or constituting a neoplasm or neoplasia, which is indicative of cancer.*),

comprising:

extracting a plurality of emerging patterns from a data set that comprises gene expression data for a plurality of cancerous cells and a gene expression data for a plurality of normal cells (*see* p. 104, §3.2, col. 1, "To investigate and monitor the gene expression profile changes in ovarian cancers, replicates of the fabricated cDNA arrays were hybridized independently with cDNA probes that were generated from seven different ovarian tumor specimens, including two papillary serous ovarian tumors, two endometroid ovarian cancers, one poorly differentiated ovarian tumor, one mucinous and one clear cell ovarian tumor.", *Examiner interprets the "seven different ovarian tumor specimens" to comprises gene expression data for a plurality of cancerous cells and a gene expression data for a plurality of normal cells.*), wherein each of said emerging patterns comprises a plurality of conjunctive conditions (*see* p. 104, §3.2, col. 2, *Examiner interprets the "cDNA clones exhibited a 3-fold or greater change in expression level in more than one ovarian tumor probe, and the signal intensity exceeded the background" [emphasis added] to be conjunctive conditions.*), each condition having a variable and a constraint (*see* above, Examiner interprets "expression level" to be a variable and "3-fold or greater change" to be a constraint.), and wherein a plurality of occurrences satisfy said conditions for an ith one of said n classes of data, but no occurrence satisfies said conditions for a remainder of said n classes

of data (*see* above, *Examiner interprets the gene expression data occurrences satisfying the first conditions, not to satisfy the second, which is the remainder of the classes.*);

creating a first list and a second list (*see* p. 104, col. 2, "After analyzing ...", Examiner interprets the first list to be the "295 cDNAs" exhibiting "greater than 3-fold overexpression in tumor probe relative to normal probe" and the second list to be the "431 cDNAs" exhibiting "greater than 3-fold overexpression in normal probe relative to tumor probe".) wherein:

said first list contains a frequency of occurrence, $f_i^{(1)}$, of each emerging pattern *i* from said plurality of emerging patterns that has a non-zero occurrence in said cancerous cells (*see* above, Examiner interprets the "295 cDNAs" exhibiting "greater than 3-fold overexpression in tumor probe relative to normal probe" to be a frequency of occurrence in the first list.) and

said second list contains a frequency of occurrence, $f_i^{(2)}$, of each emerging pattern *i* from said plurality of emerging patterns that has a non-zero occurrence in said normal cells (*see* above, *Examiner interprets the "431 cDNAs" exhibiting "greater than 3-fold overexpression in normal probe relative to tumor probe" to be a frequency of occurrence in the second list.*);

using a fixed number, *k*, of emerging patterns, wherein *k* is substantially less than a total number of emerging patterns in the plurality of emerging patterns (*see* p. 103, §3.1, col. 1, *Examiner interprets the "selected ESTs and clones from several ovarian cDNA libraries", making up the microarray, to contain the emerging patterns (i.e., genes). Examiner interprets k to be the 96 "randomly picked cDNA clones" which is much less than the 5766 members of the microarray.*), calculating:

a first score derived from the frequencies of *k* emerging patterns in said

first list that also occur in said test data (*see* p. 104, Fig. 1(A) and p. 103, §3.1, col. 2, *Examiner interprets the score to be the Cy5 to Cy3 signal ratio. Examiner interprets a first score to be "Ovarian cancer (Cy5) / Normal Ovary (Cy3)".*), and

a second score derived from the frequencies of k emerging patterns in said second list that also occur in said test data (*see* p. 104, Fig. 1(B) and p. 104, col. 1, *Examiner interprets the score to be the Cy5 to Cy3 signal ratio. Examiner interprets a first score to be "Normal Liver (Cy5) / Normal Liver (Cy3)".*); and

deducing whether the sample cell is cancerous if said first score is higher than said second score (*see* p. 104, Figs. 1(A) and 1(B) and p. 104, col. 1, "Hybridization results of the microarray with Cy3-labeled cDNA probe from normal ovary and Cy5-labeled cDNA probe from ovarian tumor demonstrate that, on average, approx. 30% of the cDNAs exhibit more than a 2-fold expression level change and about 9% of the cDNAs had a difference in expression of greater than 3-fold. Scatter plots with tumor probes revealed a very wide distribution pattern (Fig. 1B).").

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth

> in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claim 57 is rejected under 35 U.S.C. 103(a) as being as being unpatentable over Wang in view of *Sheppard* (USPN 6,026,397).

Regarding claim 57. (Original) *Wang* teaches a system for classifying an object into a first class or a second class (*see* p. 104, §3.2, col. 2, "...two criteria were used to classify candidate cDNAs as differentially expressed between normal and neoplastic ovary", *Examiner inteprets "normal and neoplastic ovary" as a first class or a second class.*), wherein information concerning said object is provided in a plurality of test data T (*see* p. 103, §3.1, *Examiner interprets the cDNA libraries to comprise a plurality of test data T.*); the system comprising:

access a data set that has at least one instance of a first class of data corresponding to said first class, and at least one instance of a second class of data corresponding to said second class (*see* col. 8, lines 1-13, *Examiner interprets the "rule based segmentation function" to comprise control instructions for: accessing a data set that has at least one instance of a first class of data and at least one instance of a second class of data. Examiner interprets the "different segments" to be at least one instance of a first class of data and at least one instance of a second class of data.*);

extract a plurality of emerging patterns from said data set (*see* p. 104, §3.2, col. 1, "To investigate and monitor the gene expression profile changes in ovarian cancers, replicates of the fabricated cDNA arrays were hybridized independently with cDNA

probes that were generated from seven different ovarian tumor specimens, including two papillary serous ovarian tumors, two endometroid ovarian ' cancers, one poorly differentiated ovarian tumor, one mucinous and one clear cell ovarian tumor.", Examiner interprets the "seven different ovarian tumor specimens" to comprises training data set D that has at least one instance of each of said n classes of data corresponding to said n classes.), wherein each of said emerging patterns comprises a plurality of conjunctive conditions (*see* p. 104, §3.2, col. 2, Examiner interprets the "cDNA clones exhibited a 3-fold or greater change in expression level in more than one ovarian tumor probe, and the signal intensity exceeded the background" [emphasis added] to be conjunctive conditions.), each condition having a variable and a constraint (*see* above, Examiner interprets "expression level" to be a variable and "3-fold or greater change" to be a constraint.), and wherein a plurality of occurrences satisfy said conditions for said first class of data, but no occurrence satisfies said conditions for said second class of data (*see* above, *Examiner interprets the gene expression data occurrences satisfying the first conditions, not to satisfy the second, which is the remainder of the classes.*), or wherein an alternate plurality of occurrences satisfies said conditions for said second class of data, but no alternate occurrence satisfies said conditions for said first class of data (*see* above, *Examiner interprets the fact that none of the values on the control group (see Fig. 1(A)) satisfy the conjunctive conditions to mean that no alternate occurrence satisfies said conditions for a remainder of said n classes of data.*);

creating a first list and a second list (*see* p. 104, col. 2, "After analyzing ...", Examiner interprets the first list to be the "295 cDNAs" exhibiting "greater than 3-fold overexpression in tumor probe relative to normal probe" and the second list to be the "431 cDNAs" exhibiting

"greater than 3-fold overexpression in normal probe relative to tumor probe".), wherein for each of said plurality of emerging patterns:

said first list contains a frequency of occurrence, $f_i^{(1)}$, of each emerging pattern i from said plurality of emerging patterns that has a non-zero occurrence in said first class of data (*see* above, Examiner interprets the "295 cDNAs" exhibiting "greater than 3-fold overexpression in tumor probe relative to normal probe" to be a frequency of occurrence in the first list.), and

said second list contains a frequency of occurrence, $f_i^{(2)}$ of each emerging pattern i from said plurality of emerging patterns that has a non-zero occurrence in said second class of data (*see* above, *Examiner interprets the "431 cDNAs" exhibiting "greater than 3-fold overexpression in normal probe relative to tumor probe" to be a frequency of occurrence in the second list.*);

use a fixed number, k, of emerging patterns, wherein k is substantially less than a total number of emerging patterns in the plurality of emerging patterns (*see* p. 103, §3.1, col. 1, *Examiner interprets the "selected ESTs and clones from several ovarian cDNA libraries", making up the microarray, to contain the emerging patterns (i.e., genes). Examiner interprets k to be the 96 "randomly picked cDNA clones" which is much less than the 5766 members of the microarray.*), calculating:

a first score derived from the frequencies of k emerging patterns in said first list that also occur in said test data (*see* p. 104, Fig. 1(A) and p. 103, §3.1, col. 2, *Examiner interprets the score to be the Cy5 to Cy3 signal ratio. Examiner interprets a first score to be "Ovarian cancer (Cy5) / Normal Ovary (Cy3)".*), and

a second score derived from the frequencies of k emerging patterns in said second list that also occur in said test data (*see* p. 104, Fig. 1(B) and p. 104, col. 1, *Examiner interprets the score to be the Cy5 to Cy3 signal ratio. Examiner interprets a first score to be "Normal Liver (Cy5) / Normal Liver (Cy3)".*); and

deducing whether the test sample is categorized in the first class of data or in the second class of data by selecting the higher of the first score and the second score (*see* p. 104, Figs. 1(A) and 1(B) and p. 104, col. 1, "Hybridization results of the microarray with Cy3-1abeled cDNA probe from normal ovary and Cy5-1abeled cDNA probe from ovarian tumor demonstrate that, on average, approx. 30% of the cDNAs exhibit more than a 2-fold expression level change and about 9% of the cDNAs had a difference in expression of greater than 3-fold. Scatter plots with tumor probes revealed a very wide distribution pattern (Fig. 1B).).

Wang does not teach at least one memory, at least one processor and at least one user interface, all of which are connected to one another by at least one bus. *Sheppard* does teach at least one memory (*see* col. 4, lines 24-59 and Fig. 1, item 14), at least one processor (*see* col. 4, lines 24-59 and Fig. 1, item 12) and at least one user interface (*see* col. 4, lines 24-59 and Fig. 1, items 20 and 28), all of which are connected to one another by at least one bus (*see* Fig. 1, *Examiner interprets bi-direction connection between processor and RAM and ROM to be at least one bus.*).

It would have been obvious at the time the invention was made to persons having ordinary skill in the art to combine *Wang* with *Sheppard* to discover discriminatory patterns and associations within large quantities of unexplored information having previously unknown relationships. The uncovered patterns and associations in the data and expected relationships can be verified quickly and easily with the neural clustering function.

Response to Arguments

4. Applicant's arguments filed DATE have been fully considered but they are not persuasive.

Rejection of Claims 1-66 and 68-75 Under 35 U.S.C. §101

Applicants argue:

> Claims 47-56 and 68-75 have been canceled. Independent claim 1 has now been amended to include, inter alia, "a method for classifying an object into one of a number n of classes wherein n is 2 or more, wherein information concerning said object is provided in a plurality of test data T." Similar amendments have been made to independent claims 11 and 57. Applicants submit that the claims, as amended, now provide a useful, concrete and tangible result and as such, now constitute patentable subject matter. Withdrawal of the rejection under 35 U.S.C. 101 is respectfully requested.

Examiner responds:

> Examiner acknowledges the cancellation of claims 47-56 and 68-75. Examiner considers the amendment to claim 1 and similar amendments to independent claims 11 and 57 to not have placed the claims into a statutory state. Examiner considers "classifying an object" by "deducing which of said n classes the object is categorized in, by selecting the highest of said n scores" to be a mathematical abstraction having no effect in the real-

world, even though the data comes from real-world sources. Examiner maintains the rejection of claims 1-10 and 21-46, 11-20, and 57-66 under 35 U.S.C. 101.

Rejection of Claims 1, 11, and 67 Under 35 U.S.C. §102(b)

Applicants argue:

Claim 1 have been amended to include, inter alia, "extracting a plurality of emerging patterns from a training data set D that has at least one instance of each of n classes of data corresponding to said n classes, wherein each of said emerging patterns comprises a plurality of conjunctive conditions, each condition having a variable and a constraint, and wherein a plurality of occurrences satisfy said conditions for an ith one of said n classes of data. but no occurrence satisfies said conditions for a remainder of said n classes of data." Similar amendments have been made to claims 11 and 67.

Wang et al teaches a method of monitoring gene expression profile changes in carcinomas using a cDNA microarray. Wang et al selects individual variables (namely, the cDNA probes) that are expressed differentially between the two classes. The expression difference is measured by fold, namely the absolute expression level in one class divided by the absolute expression level at the other class.

This is very different from the emerging pattern system and method as now positively claimed in claims 1, 11, and 67. As now positively recited in claims 1, 11, and 67, an emerging pattern (EP) is a pattern that "comprises a plurality of conjunctive conditions, each condition having a variable and a constraint." Take for example 'gene A's expression level' is 'less than 1000.0'. The first part is a variable, while the second part is a constraint. Given a pattern, if"a plurality of occurrences satisfy said conditions" in this pattern, "but no occurrence satisfies said conditions for a remainder of said n classes of data" as is recited in claim 1 and similarly required by the other independent claims, then this pattern is an emerging pattern. These emerging pattern systems and methods are not disclosed or even suggested in the Wang et al reference.

Examiner responds:

Examiner acknowledges the amendment of claims 1, 11, and 67 and the cancellation of claims 47, 71 and 73. Examiner considers the amendment to claim 1 and similar amendments to independent claims 11 and 67 to not have traversed *Wang* based on new

grounds of rejection. Essentially, it is shown that Wang discloses "a plurality of conjunctive conditions, each condition having a variable and a constraint". Claim 57 has been given new grounds of rejection due to amendment. Examiner maintains the rejection of claims 1, 11, and 67 under 35 U.S.C. §102(b) and rejects claim 57 under 35 U.S.C. §103(a).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan H. Brown, Jr. whose telephone number is 571-272- 8632. The examiner can normally be reached on M-F 0830-1700. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 571-272-3687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Anthony Knight
Supervisory Patent Examiner
Tech Center 2100

Nathan H. Brown, Jr.
August 28, 2007